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ABSTRACT

Five severely disabled middle school students received peer training in self-monitoring their classroom behaviors. Teachers chose 11 target behaviors to increase student participation in the general education classroom. Each participating student was assigned a nondisabled eighth-grade peer tutor who received 8 weeks of training in delivery of praise, positive reinforcement, error correction, and data collection. Peer tutors discussed with their participating students how the students would learn to keep track of their own behaviors. Peer tutors gave examples of target behaviors; taught participating students to use the self-recording sheet; and provided feedback, encouragement, and praise. Training was discontinued when appropriate self-recording was demonstrated, with 80 percent agreement between tutor and student, and reinstituted when agreement dropped below 80 percent. After training began, correct student performance of target behaviors rose dramatically. These gains continued through the maintenance condition without retraining for two students and with only two retraining sessions for the other three students. No problems were encountered that related to student ability to self-monitor or peer tutors' delivery of training. All students reported that their "fit" in the classroom improved after they learned to self-monitor. The findings confirm that peer tutors can effectively deliver instruction and that students with severe disabilities can learn to take control of their actions and increase their participation in inclusive settings. (SV)

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THE EFFECTS OF PEER-DELIVERED SELF-MONITORING STRATEGIES ON THE PARTICIPATION OF STUDENTS WITH DISABILITIES IN GENERAL EDUCATION CLASSROOMS

Historically, students with disabilities have not been encouraged or taught to self-manage their lives despite what we know from practice and research (Agran, 1997). Self-monitoring techniques have been successfully taught to and used by students who have mild, moderate, or severe mental retardation (Agran & Martin, 1987; Browder & Shapiro, 1985; Harchik, Sherman & Sheldon, 1992; Hughes, Korinek, & Gorman, 1991; O'Leary & Dubey, 1979; Rosenbaum & Drabman, 1979).

One means of delivering self-monitoring instruction to students with disabilities is through the use of peer-tutors. A number of studies have demonstrated that peers can deliver instruction effectively (Farmer-Dougan, 1994; Greenwood, 1984; Marchand-Martella et al., 1992), and using peers to mediate instruction for students with disabilities has been shown to benefit both the student and the peer (Allen, 1976; Campbell, Brady, & Lineham, 1991; Kennedy & Itkonen, 1994). Using peers to teach self-monitoring strategies to students with severe disabilities represents a potentially effective means to extend the participation of these students in general education classes.

The purpose of the present study was to examine the effects of peer-delivered self-monitoring strategies on the participation of five students categorized as severely disabled in general education activities. Ancillary purposes of this study were to examine the accuracy of self-recording behavior of participating students, determine the fidelity of instruction of a set of behavioral skills by peer tutors, and determine if the participating teachers reported a change in the "fit" of the participating students in their classes.

Methods

Participants

Students. Five middle school students participated in this study. These students were selected because they all were receiving special education services for students with severe disabilities, were working on IEP goals in general education classes, and because their parents were interested in promoting self-determination in their children. Seldom did any of the five students demonstrate behavior generally considered to be disruptive, however, each student required assistance in such areas as expressing her- or himself, asking for help, or speaking loudly and clearly enough to be understood.

Table 1

Student Characteristics

	Age	Classification	Reading Level	Language	Spch/ Lang. Instr.	Gen.Ed. Class (grade)
Karol	13	MR/Sev.	2.4	low	Yes	Spanish (6th)
Jewel	15	MR/Sev	2.3	low	No	History (8th)
Jerry	14	MR/Sev	2.3	low	Yes	Art (8th)
Daniel	12	MR/Sev	2.1	low	Yes	Art (7th)
Cindy	13	MR/Sev	1.8	low	No	Reading (6th)

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Teachers. Four regular educators were involved in the study. All had taught students with mild learning disabilities in their classes, but had limited classroom experience teaching students with severe disabilities. Content subjects of these teachers included U.S. history, art, reading, and Spanish. Although the art teacher taught two of the participating students, the students were in different art classes.

Peer Tutors. Each participating student was assigned an eighth-grade student peer tutor. The participating peer tutors received training in the delivery of praise, positive reinforcement, error correction, and data collection.

Setting. The study was conducted in a middle school (approximately 800 students) in a small town (2,000 population) in the western United States. The school day consisted of seven periods of 44 minutes each. Typical general education class sizes were 30 to 35 students. Supports for special education students included a trained peer tutor as well as content curriculum adapted for the needs of the participating student.

Primary Dependent Measures

The primary dependent measure is expressed as the percentage of correct target behaviors. Peer tutors recorded the daily target behaviors of the students and these data were expressed as percentage of correct responses.

Target Behavior Selection and Definition. Target behaviors were developed in consultation with the classroom teachers. Each teacher developed a list of behaviors considered to promote participation in their classes. These behavior were compiled and ranked and the final list of 11 Target Behaviors contains those behaviors which the teachers indicated were the most important in their classrooms. (See Table 2)

Each target behavior was operationally defined in order to facilitate accurate observation and recording. The student could self-record their behavior at anytime during the class sessions, but all data had to be recorded before she/he left the classroom. Peer-tutors recorded "in class", "in seat", and "appropriate materials" at the beginning of the classperiod. Other behaviors were recorded when they occurred.

Table 2

Teacher Chosen Behaviors to Increase Class Participation

Number	Target Behaviors
1	In class when bell rings
2	Seated when bell rings
3	Bring appropriate materials to class
4	Greet teacher
5	Greet other students
6	Asks questions
7	Answer questions When Addressed by Teacher
8	Sit up
9	Look at teacher
10	Acknowledge teacher
11	Record classwork

Secondary Dependent Measures

Secondary dependent measures were: (a) the fidelity of the peer tutor training of self-monitoring, and (b) the occurrence and accuracy of the students' self-monitoring target behaviors and the change in the specific student-selected goal. The occurrence of self-monitoring was expressed as a percentage of the times that students self-recorded target behaviors divided by the total number of target behaviors. Accuracy of self-monitoring was

determined by comparing the self-recording of the participating student with the observational recording of the peer tutor. All results were computed daily and reported as a percentage of agreements over agreements plus disagreements multiplied by 100.

Peer Tutor Instruction

Peer tutors were taught to deliver self-monitoring instruction to the participating students using Lovitt's (1992) self-management training package. Instruction in self-monitoring was given to all selected peer tutors for 8 weeks twice weekly in 20-minute blocks. Self-monitoring instruction delivery for peer tutors was complete when they demonstrated an 100% mastery of the skills taught over three consecutive training sessions.

Treatment Fidelity and Interobserver Agreement. To ensure the appropriate delivery of self-monitoring strategy instruction, an adult paraprofessional observed the peer-delivered training process 100% of the time. The same items used in the initial peer tutor training were used to determine how accurately the peer tutor delivered the instruction. An agreement of less than 80% during baseline and maintenance (100% during training) initiated peer tutor retraining. Retraining took place before the next day's instructional session. Three peer tutors required a retraining session. Once retrained, none of the peer tutors required further retraining. Observers observed 46% of all sessions and the mean agreements of the peer tutors and the observers were consistently high, with a range of 91% to 100%. Only in two conditions across all of the students did the mean agreement fall below 90% (see Table 3).

Experimental Design and Conditions

A multiple baseline across subjects design was used for this study. The experimental conditions included baseline, training, and maintenance.

Baseline. Baseline for the primary dependent variable took place in the general education classroom. During this time the peer tutor observed and recorded the incidence of student target behavior performance. At no time during baseline did the peer tutor reinforce, praise, or correct the participating student for responses or lack of responses of target behaviors. Intervention was initiated only after a stable pattern was observed.

Training. The participating students were taught by peer tutors to self-monitor in the general classroom. Generally, teachers used the first 30 minutes of class time to review previous instruction, provide new instruction, and initiate guided practice for the students in class. Typically, the last 10 minutes of each class was reserved for students to work on class assignments. Although peer tutors and participating students worked together throughout the class period, the last 10 minutes of the class period was devoted to self-monitoring strategy instruction.

First, the peer tutor introduced and discussed with the participating student how the student would learn to keep track of her/his own behavior. Next, the peer tutor gave examples and non-examples of the target behavior. Third, the peer tutor taught the participating student how to correctly use the self-recording sheet. The peer tutor provided practice in self-monitoring and gave the participating student feedback and praise throughout the training. The peer tutor also encouraged the student to ask as many questions as needed before the participating student was expected to begin self-monitoring. Finally, the peer tutor encouraged the student to turn in the self-monitoring sheet to the researcher at the end of each class.

Maintenance. After the participating student demonstrated appropriate self-recording with an 80% agreement between student and peer tutor for three sessions, direct intervention was withdrawn. No further praise and feedback were given but the peer tutor continued to give the participating student a self-monitoring sheet at the beginning of each class period. Maintenance data were taken daily by the peer tutor through direct observation. When a student's correct target behavior performance dropped below 80% for two consecutive sessions, the peer tutor retrained the student. During retraining, the peer tutor provided praise and positive feedback to the student. Once the participating student's target behavior increased to 80% or higher for two

consecutive sessions, retraining was discontinued and the peer tutor discontinued reinforcement. Three students received retraining during maintenance.

Social Validation. Social validation data were obtained from two sources. First, each general education teacher was asked at the end of the maintenance condition to rate the change in participation of the student in the general education classroom. The teachers were also asked to describe the fit of the participating student in the classroom and if the self-monitoring instruction disrupted the class routine. Second, each participating student was asked before the training condition, as well as at the end of the maintenance condition, to rate her or his participation in the general education class. Students were also asked at the end of the maintenance condition if they thought they fit into the general education class.

Results

Primary Dependent Measure – Target Behaviors

Table 3 shows the combined Target Behavior performance data for all five students across the baseline, training, and maintenance conditions. Table 4 reports mean performance for each Target Behavior for students per condition. All students demonstrated a stable pattern during baseline. Each student's performance of Target Behaviors increased when training was introduced. Despite marked variability for some of the students these changes persisted during the maintenance condition. There appeared to be no pattern or cycle in any of the students' performance attributable to any particular day of the week, holiday, or special event.

Table 3
Mean Percentage of Correct Responses and Agreement by Experimental Condition Between Students and Peer Tutors

Student	Condition	Target behaviors[a]	Self-monitoring[b]	Student / peer tutor agreement
Karol	Baseline	31.6	--	--
	Training	68.3	68.9	94.4
	Maintenance	85.4	85.8	99.3
Jewel	Baseline	32.7	--	--
	Training	82.0	82.0	86.5
	Maintenance	91.2	95.5	93.6
Jerry	Baseline	20.1	--	--
	Training	91.0	95.5	91.0
	Maintenance	95.1	97.3	97.3
Daniel	Baseline	29.8	--	--
	Training	89.5	91.0	100.0
	Maintenance	88.4	96.8	91.0
Cindy	Baseline	13.4	--	--
	Training	76.4	82.0	94.8
	Maintenance	77.3	98.5	78.6

Note. -- indicates no available data
[a]Data collected by peer tutor. [b]Student self-recorded data

Student Self-Monitoring

Although the students' self-recorded data were higher than the mean levels reported by the peer tutors, the differences were generally negligible. Neither students, peer tutors, or observers reported any problems by students in self-monitoring or self-recording their behavior.

Teacher Rating of Student Participation Change

No teacher reported any disruptions in the general classroom routine resulting from the self-management training. Most of the teachers reported that the students participation in the classroom improved. However, Jerry's teacher reported: "I don't see any consistent change - in fact he responds appropriately only when reminded." The teacher felt that ."..he creates a lot of disturbance. He does not work at all." She also stated, "I feel he has not benefited from the experience, nor has the class." On the other hand, this same teacher reported concerning Daniel that he "...has done very well. He learns and has followed through with constant improvement. He has worked well and tries to please. He is always happy and positive. Other kids have learned from him." She ended her statements by saying, "A great experience!" Cindy's teacher reported that "she seems less frightened...she knows what is expected of her" and that "she follows directions better."

Table 4
Mean performance of Target Behaviors by Experimental Condition

Student	Condition	Target Behaviors										
		1	2	3	4	5	6	7	8	9	10	11
	Baseline	100	100	0	0	0	13	13	0	88	38	0
Karol	Training	100	100	89	44	0	67	44	78	67	56	89
	Maintenance	100	100	90	80	10	65	70	100	100	90	100
	Baseline	78	67	11	0	0	0	0	11	100	100	11
Jewel	Training	100	75	50	50	50	25	100	75	75	75	75
	Maintenance	100	100	83	83	83	67	67	100	92	92	100
	Baseline	84	84	4	0	0	4	0	8	52	4	0
Jerry	Training	100	100	75	50	75	100	100	100	100	100	100
	Maintenance	94	94	100	50	100	94	94	100	100	94	100
	Baseline	93	93	0	0	0	30	60	0	44	30	0
Daniel	Training	100	100	100	80	80	100	80	80	100	100	100
	Maintenance	100	100	93	93	86	64	86	57	93	86	100
	Baseline	77	74	0	0	0	0	0	0	0	0	0
Cindy	Training	75	75	100	100	75	50	50	75	50	50	75
	Maintenance	100	67	67	83	67	67	83	83	83	83	67

1=In class when bell rings, 2=Seated when bell rings, 3=Bring appropriate materials to class
4= Greet teacher, 5= Greet other students, 6= Asks questions, 7= Answer questions
8= Sit up, 9= Look at teacher, 10= Acknowledge teacher, 11= Record classwork

Students Pre- and Posttraining Ratings of Class Participation

Before baseline began, each target behavior was read to the students and they were asked to rate their participation. When the students were near the end of maintenance, they were again asked to rate their participation in the general education classroom according to the target behaviors. They were also asked to answer the questions: "Do you think that you fit in the (general education) class? If you do, why do you think so

Each of the students believed that her or his participation in class was a little better at the end of the study than at the beginning. Jewel was the only student to rate her post- classroom participation significantly higher than her pre-classroom participation.

Concerning student perception of fit in the classroom, Karol felt that she fit in the class because "I get to know the kids. We get to play games." Jewel stated she felt that she fit in the class because "I have friends and it's fun." Jerry felt that he fit in the class because "I am a student in there. They make me feel welcome." Daniel remarked that "I like to be with them. I like to have fun." Cindy also felt that she was part of the general education classroom, although her reasons ("play in the dark" and "have fun") did not seem to fit the activities of the Reading class.

Discussion

The study investigated the effects of peer-delivered instruction in self-monitoring strategies on performance of students with severe disabilities in the general classroom. The baseline data revealed that these behaviors were not part of the participating students' daily behavior. When instruction in self-monitoring was initiated in the training condition, correct student performance of target behaviors rose dramatically. These gains in behavior performance continued during the maintenance condition without retraining in the case of Jewel and Jerry, and with only two sessions of retraining for Karol, Daniel, and Cindy. The fact that all five students dramatically changed specific behaviors by utilizing self-monitoring in a general education classroom suggests that self-monitoring may be an effective tool to be used with other behaviors targeted for change.

No problems concerning student ability to self-monitor were reported by peer tutors or observers during the study. On the contrary, the data indicate that students began to appropriately self-record from the beginning of the training condition. The mean percentage agreement between student self-recording and peer tutor recording of correct target behavior performance was in the high 90s for the training and maintenance conditions. These high mean agreements indicate that, despite some difference between student self-recording and peer tutor recording, students with severe disabilities are reasonably capable of gathering data on their own behavior.

As previously mentioned, all the students in this study dramatically increased their performance of the teacher-chosen behaviors in those teachers' classrooms. Generally, the teachers observed the change in their students' participation. However, teachers perceived the extent of change in participation by some students differently than indicated by the target behavior data.

None of the teachers reported any problems with peer tutors delivering instruction to the participating students. This suggests that peer tutors and the instruction they delivered are viable options for special educators searching for a method of delivering support and services in the general education environment. The data indicate that using peer tutors to instruct students with severe disabilities in self-monitoring increased those students' participation in the general classroom and that this change in classroom participation was recognized by the teachers of four of the five students.

Another aspect of determining the social validity of this study is the impact on the participating students. Every student reported that her or his fit in the classroom had improved after she/he learned to self-monitor. Generally, students stated that they felt they fit in the general education class because they had friends there, they were liked, or they had fun in the class. Every student rated her- or himself as participating to a greater extent after instruction in self-monitoring than before that instruction. Additionally, teacher ratings of the students were generally in agreement with both the observational data and the student ratings. Changes in participation ratings suggested that the students recognized their behavior had changed. Greater self-awareness may indicate a move by the students toward enhanced self-determination (Wehmeyer et al., 1998).

Finally, the study confirms that peer tutors can effectively deliver instruction. The peer tutors in this study delivered self-monitoring instruction at a high level, consistent with the training they received. The findings suggest that well-trained peers can be an effective tool in delivering self-management instruction to students with severe disabilities.

The study demonstrates that students with severe disabilities can learn to take greater control of their actions, increase their participation in inclusive settings, and increase their positive attitudes toward those settings. This is done without increasing the workload of the general education teacher. Nondisabled students can deliver instruction in the general education classroom without disturbing the classroom environment. This study demonstrates a promising means of promoting more and better participation by students with severe disabilities in inclusive settings without unduly burdening either special or general education teachers.

In summary, this study suggests an effective means of preparing students with severe disabilities to participate more fully in general education settings. Participating students in this study reported feeling a part of their general education classrooms and indicated they were aware of an increase in their classroom participation. Teachers generally reported that the students demonstrated increased participation after receiving instruction in self-monitoring for specific participation behaviors. In all, self-determination strategies may greatly promote the participation and inclusion of students with severe disabilities in general education, and their use is strongly advocated.

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